

Remarks

Claims 11-16 and 18-24 are now pending in this application. Applicant has amended claims 11, 15, 16, 18, 19, and 21-23 and canceled claim 17 to clarify the present invention. Applicant respectfully requests favorable reconsideration of this application.

Applicant has amended the claims to address the objection to the claims and the indefiniteness rejection. Applicant submits that all pending claims comply with 35 U.S.C. § 112, second paragraph and respectfully request withdrawal of this rejection and objection.

The Examiner rejected claims 11-17, 20, and 21 under 35 U.S.C. § 103(a) as being unpatentable over *Quantum well infrared photodetectors with bi-periodic grating couplers*, to Lee et al. in view of U.S. patent 5,056,889 to Morgan. The Examiner rejected claims 22-24 under 35 U.S.C. § 103(a) as being unpatentable over Lee et al. in view of Morgan, U.S. patent 5,373,182 to Norton and art discussed in the specification.

The combination of Lee et al. and Morgan does not suggest the present invention since, among other things, the combination does not suggest a single detector having a detection surface that includes a grating surface that varies over the detection surface such that the grating period increases with increasing distance from the center as recited in independent claims 11 and 22. Rather, the references suggest a photodetector that includes a **bi-periodic** grating coupler. This means that there are only two grating periods. The grating periods appear to be repeated over the surface of the structure. This is borne out by the text and figures of Lee et al. For

example, at page 2437, col. 1, states that, "[W]e present a QWIP using a novel bi-periodic grating which consists of two conventional gratings with different periods for light coupling." Lee et al. goes on to state that. "The bi-periodic grating can be considered as a combination of two gratings." The gratings have periods d_1 and d_2 . Fig. 1 shows the fabrication of the grating. As shown in Fig. 1, the grating includes a region having one grating period and a second region having a second grating period joined to the first region. As described at page 2437, col. 2, Lee et al. states that, "Stripe gratings with a single period and double period (bi-periodic) were fabricated on the same chip at the same time." The resulting structure, as shown in the left-hand side of Fig. 3, is a bi-periodic grating that includes alternating strips that have one grating period or the other.

In view of the above, Lee et al. does not suggest a structure that includes a grating surface that varies over the detection surface such that the grating period increases with increasing distance from the center. Rather, in considering the bi-periodic grating shown in Fig. 3 of Lee et al. from an up and down direction, the grating period is constant. On the other hand, from left to right, the grating period jumps up and down between the two values. Clearly, this differs from the structure recited in claims 11 and 22.

As a result, Lee et al. in combination with Morgan, Norton and/or art discussed in the specification does not suggest the structure recited in independent claims 11 and 22. It follows that Lee et al. does not suggest the present invention as recited in claims 12-21, 23, or 24, which depend from claims 11 and 22.

In view of the above, the references relied upon in the office action, whether considered alone or in combination, do not suggest patentable features of the present invention. Therefore, the references relied upon in the office action, whether considered alone or in combination, do not make the present invention obvious. Accordingly, Applicant respectfully requests withdrawal of the rejections based upon the cited references.

In conclusion, Applicant respectfully requests favorable reconsideration of this case and early issuance of the Notice of Allowance.

If an interview would facilitate the prosecution of this case, Applicant urges the Examiner to contact the undersigned at the telephone number listed below.

The undersigned authorizes the Commissioner to charge fee insufficiency and credit overpayment associated with this communication to Deposit Account No. 22-0261.

Respectfully submitted,

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